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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-------------------------|------------------|
| 10/040,543      | 01/07/2002  | Joon-Won Kang        | Honeywell No. B10-17363 | 2452             |

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EXAMINER

MANDALA, VICTOR A

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                  |                  |
|------------------------------|----------------------------------|------------------|
| <b>Office Action Summary</b> | Application No.                  | Applicant(s)     |
|                              | 10/040,543                       | KANG, JOON-WON   |
|                              | Examiner<br>Victor A Mandala Jr. | Art Unit<br>2826 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 19 May 2003.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-52 is/are pending in the application.

4a) Of the above claim(s) 23-52 is/are withdrawn from consideration.

5) Claim(s) 22 is/are allowed.

6) Claim(s) 1-5 and 7-21 is/are rejected.

7) Claim(s) 7 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

|   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Response to Amendment***

1. The Applicant has amended the claims in Paper No. 6 to clarify the Applicant's invention and the Applicant also argues that the prior art reference used in Paper No. 5, U.S. Patent No. 6,388,299 Kang et al., does not teach insulation posts and the function of a threshold acceleration detection. The examiner has considered the Applicant arguments, but finds them to be non-persuasive. Kang et al. teaches insulation posts in Figure 14n #184, but labeled in Figure 14e. Kang et al.'s disclosure teaches the material used for #184 in Col. 11 Lines 37-42 as being made of silicon nitride, which is an insulator and does support something above it. The argument of the function of a threshold acceleration detection can also be found in Kang et al. Kang et al. teaches a threshold switch which turns on when a specific amount of pressure is met and the gate #214, (which has a mass), is forced closer to the channel, (Col. 9 Lines 59-61 & Col. 10 Lines 18-26). Kang et al. teaches a force that is applied to the mass, which in return forces the mass closer to the channel and the switch is then turned on. The Applicant is arguing the physical force that is applied to the disclosed invention is different from the applied force that is used in Kang et al's. The examiner views the forces to produce the same outcome and the structural design as described in the claimed limitations are the same and would also result in the same functions. In reference to the claim language referring to [the function acceleration detection], intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a

manipulative difference as compared to the prior art. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963). The 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,388,299 Kang et al. stands as is for claims 1-5 and 7-21.

2. The Applicant has amended the claims in Paper No. 6 to clarify the Applicant's invention and the Applicant also argues that the prior art reference used in Paper No. 5, U.S. Patent No. 5,627,397 Kano et al., does not teach the function of a threshold acceleration detection being a switch where the voltage is turned on and off. The examiner has considered the Applicant arguments, and agrees. The 35 U.S.C. 102(b) rejection as being anticipated by U.S. Patent No. 5,627,397 Kano et al. and the 35 U.S.C. 103 (a) rejection in view of U.S. Patent No. 5,627,397 Kano et al. is withdrawn

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

Claims 1-5 and 7-21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,388,299 Kang et al.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

3. Referring to claim 1, a contactless acceleration switch system, comprising in combination: a substrate layer, (Figure 14n #180), containing a source, (Figure 14n labeled source), a drain, (Figure 14n labeled drain), and a threshold adjustment channel, (Figure 14n examiner’s label #500); a gate insulating layer, (Figure 14n #290), located substantially above the source, (Figure 14n labeled source), the drain, (Figure 14n labeled drain), and the threshold adjustment channel, (Figure 14n examiner’s label #500); at least two insulator posts, (Figure 14n #184), wherein the source, (Figure 14n labeled source), the drain, (Figure 14n labeled drain), the threshold adjustment channel, (Figure 14n examiner’s label #500), and the gate insulating layer, (Figure 14n #290), are located substantially between the at least two insulator posts, (Figure 14n #184); a mass, (Figure 14n #214); and a spring, (Figure 14n #234, 250, & 292), substantially supporting the mass, (Figure 14n #214), above the substrate layer, (Figure 14n #180), wherein the spring, (Figure 14n #234, 250, & 292), is attached to each of the at least two insulator posts, (Figure 14n #184).

4. Referring to claim 2, a contactless acceleration switch system, wherein the substrate layer, (Figure 14n #180), is composed of a semiconductor material, (Col. 11 Line 39).

5. Referring to claim 3, a contactless acceleration switch system, wherein the semiconductor material is silicon, (Col. 11 Line 38-42).

6. Referring to claim 4, a contactless acceleration switch system, wherein the gate insulating layer, (Figure 14n #290), is composed of silicon dioxide, (Col. 12 Line 51).

7. Referring to claim 5, a contactless acceleration switch system, wherein the at least two insulator posts, (Figure 14n #184), are composed of an insulating layer, (Col. 11 Lines 39-42).
8. Referring to claim 7, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), is composed of an electrically conductive material, (Col. 11 Lines 64-67).
9. Referring to claim 8, a contactless acceleration switch system, wherein the electrically conductive material is doped silicon, (Col. 11 Lines 64-67).
10. Referring to claim 9, a contactless acceleration switch system, wherein the spring is composed of an electrically conductive material, (Col. 12 Line 38).
11. Referring to claim 10, a contactless acceleration switch system, wherein the electrically conductive material is doped silicon, (Col. 12 Lines 37-38).
12. Referring to claim 11, a contactless acceleration switch system, wherein the threshold adjustment channel, (Figure 14n examiner's label #500), is doped to a level to cause the threshold adjustment channel, (Figure 14n examiner's label #500), to invert when the mass, (Figure 14n #214), moves substantially towards the substrate layer, (Figure 14n #180) and (Col. 7 Lines 14-16).  
It is inherent that all channels are doped such that they invert at the Voltage Threshold and it is known that when the mass is closer to the substrate the voltage drop between the mass and the channel has more effect to invert the channel, and appropriately doping the channel that corresponds to the  $V_{th}$  which is induced by the mass movement.
13. Referring to claim 12, a contactless acceleration switch system, wherein the gate insulating layer, (Figure 14n #290), substantially limits electric conduction between the mass, (Figure 14n #214), and the substrate layer, (Figure 14n #180).

It is inherent that an insulator insulates, such as the gate insulator will limit the electrical conduction between the mass and the substrate layer.

14. Referring to claim 13, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), operates as a moveable gate, (Figure 14n #214 & Figure 3 and 4).

15. Referring to claim 14, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), the source, (Figure 14n labeled source), and the drain, (Figure 14n labeled drain), operate as a field effect transistor, (Col. 5 Line 31).

16. Referring to claim 15, a contactless acceleration switch system, wherein an air gap is located substantially between the mass, (Figure 3&4 #46), and the substrate layer, (Figure 3&4 #48), when an acceleration level is substantially below a threshold acceleration value, (Figure 3 and 4 & acceleration labeled #60) and (Col. 7 Lines 20-27).

17. Referring to claim 16, a contactless acceleration switch system, wherein the mass, (Figure 3&4 #46), moves substantially towards the substrate layer, (Figure 3&4 #48), when a threshold acceleration value is detected, (Figure 3 and 4 & acceleration labeled #60) and (Col. 7 Lines 20-27).

18. Referring to claim 17, a contactless acceleration switch system, wherein the threshold adjustment channel inverts when the mass moves towards the substrate layer.

It is inherent that all channels are doped such that they invert at the Voltage Threshold and it is known that when the mass is closer to the substrate the voltage drop between the mass and the channel has more effect to invert the channel, and appropriately doping the channel that corresponds to the  $V_{th}$  which is induced by the mass movement.

19. Referring to claim 18, a contactless acceleration switch system, wherein current flows between the source and the drain when the threshold adjustment channel inverts.

It is inherent to normal mosfet behavior that the channel must be inverted for the transistor to be on and that is when current will flow from the source and drain.

20. Referring to claim 19, a contactless acceleration switch system, wherein the source and the drain act as electrodes providing an electrical signal that indicates that a threshold acceleration value is detected.

A source and drain are commonly provided with source and drain electrodes, so the expression that the elements act as electrodes is inherent to all mosfets.

21. Referring to claim 20, a contactless acceleration switch system, wherein a substantially constant voltage is applied between the mass and the substrate layer.

At a given point of operation it is clear that a constant voltage between the substrate and the gate because the Vth for a given mosfet is always constant.

22. Referring to claim 21, a contactless acceleration switch system, wherein the substantially constant voltage is determined by factors selected from the group consisting of mass size, spring constant, operation range, and hysteresis, (Col. 8 Lines 26-59).

#### *Allowable Subject Matter*

23. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

24. Claim 22 is allowed.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (703) 308-6560. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
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VAMJ

July 30, 2003